THE SOUTH-EASTERN UNION OF SCIENTIFIC SOCIETIES.

THE twelfth annual congress of the South-Eastern Union of Scientific Societies, which opened at Woolwich on June 12 and closed on June 15, was in every way a very successful gathering. At the first evening meeting, held in the New Town Hall, Mr. Francis Darwin, F.R.S., the retiring president, introduced his successor, Prof. Silvanus P. Thompson, F.R.S., who delivered the inaugural address. This was an eloquent discourse, mainly on the value of voluntary work in science—such work as is carried on non-professionally by members of local scientific societies constituting the South-Eastern Union. These societies consist chiefly of persons who may be called, in the best sense of the word, amateurs. Exposing the fallacy of the popular saying that "a little knowledge is a dangerous thing," the president advocated the cultivation of scientific hobbies, enlarged on the value of acquiring a taste for studies outside the monotonous round of daily work, and showed how science had frequently been advanced by the work of amateurs. Among examples of famous amateurs, he pointed to William Herschel, originally a teacher of music; Gilbert, of Colchester, who was a medical man; and Joule, a Manchester brewer: nor were Spottiswoode, De la Rue, and Dr. Dallinger overlooked, whilst Sir Edward Fry's study of British mosses was cited as a contribution to science by an eminent lawyer. But to an audience at Woolwich the most telling example was that of William Sturgeon, the inventor of the electromagnet, who lived at one time as a shoemaker at Woolwich. Electricity has indeed been to a large extent a layman's science.

Prof. Thompson dwelt at some length on Goethe's researches on colour, and rather startled his hearers by affirming that in the famous controversy with Newton the poet-philosopher was in some sense right. Looking at natural science with the eye of a poet, Goethe failed to comprehend the value of Newton's work, and obstinately maintained that in the prismatic analysis of light the colour was derived from the prism itself, and not from the white light. But though it is generally held that the *Farbenlehre*, in which he published his views, embodies an elaborate optical heresy, it has, strangely enough, been recently shown by Lord Rayleigh's researches that there is, after all, some truth in Goethe's contention.

As Prof. Thompson proceeded, he rather surprised the naturalists by recalling his early rambles in Yorkshire, and showing himself to be an excellent botanical observer. The preservation of our wild flowers, which are really the property of the community, is an important subject which he commended to the consideration of local societies. It would be true patriotism, he held, to establish a New Primrose League for the protection of this flower, which in some places, as in Epping Forest, has become practically extinct. Another subject which he suggested might be advantageously taken up by the societies of the South-Eastern Union was that of constructing a map of the Weald, which should show the position of all the old furnaces, forges, hammer-ponds, cinder-heaps, and other relics of the iron-making industry for which the Weald was so long famous.

It is interesting to note that by the generous action of the local committee the presidential address of Prof. Thompson was open to the public. This innovation was one of several excellent features that characterised the Woolwich congress.

As it unfortunately happened that Prof. Thompson was unable to attend after the delivery of his address, the subsequent proceedings of the congress were presided over by a former president, the Rev. T. R. R. Stebbing, F.R.S. At one of the meetings an interesting lecture on an experiment in cooperative field-work in botany was given by Prof. F. W. Oliver, F.R.S. A few years ago a party of students acquired a salt-marsh with sand dunes at Erquay, in Brittany, where they have established a laboratory. The vegetation consists chiefly of suæda grass and salicornia, backed by a growth of juncus. The observations have been directed mostly to the study of the way in which the growth of halophytes is affected by variation in the salinity of the soil.

An evening lecture was given by Mr. W. Whitaker, F.R.S., entitled "Some Ideals for Local Geologists," in which he offered excellent advice to the societies in the union, urging upon their members the necessity of cultivating habits of observation and seizing the opportunity of describing every geological section that might be exposed within their area. At other meetings Dr. Treutler, of Brighton, read a paper on Goethe as a naturalist; Mr. Norman Gray brought forward some suggestions for making local scientific societies more efficient; Mr. W. H. Griffin discussed the antiquity of the horse, with special reference to remains found in Kent; and Mr. G. F. Chambers advocated the storage and use of rain-water for domestic purposes.

In the excursions to which the afternoons were devoted Mr. Whitaker was the principal guide when geology was concerned, whilst the archæological remains were described mostly by Mr. W. T. Vincent, the president of the Woolwich Antiquarian Society, who also read a paper at the congress on local archæology.

At a reception given in the Town Hall by the Mayor of Woolwich, two illustrated lecturettes were delivered, one by Dr. G. Abbott entitled "Life in Rocks and Minerals," dealing chiefly with the formation of concretions, followed by one on xerophytes by Mrs. W. Plomer Young, of the Battersea Polytechnic.

An interesting feature of the meeting was the temporary museum, which contained an exceptionally large collection of objects illustrating natural history, under the superintendence of Mr. W. H. Griffin, of Catford. Many of the exhibits showed the results of nature-study in the elementary schools of the London County Council, and by the thoughtfulness and generosity of the local committee the children of the neighbouring schools were brought in parties to visit the museum.

It had been intended to present the delegates of the constituent societies of the union with a local handbook, similar to that sometimes issued at meetings of the British Association. But so large a number of writers had contributed essays on special subjects of local interest that the printing was delayed, and the publication necessarily deferred.

It should be remarked that the conspicuous success of the Woolwich congress was mainly due to the fact that the work of the honorary secretary, the Rev. R. Ashington Bullen, was aided by a powerful local committee, which included such enthusiastic workers as the Rev. C. H. Grinling and Mr. W. T. Vincent.

THE INSTITUTION OF MINING ENGINEERS.

THE forty-sixth general meeting of the Institution of Mining Engineers, which now numbers more than 3000 members, was held in the rooms of the Geological Society, London, on June 13 and 14, and was attended by a large and representative gathering from the various coal-mining districts. Mr. Maurice Deacon gave an admirable presidential address, in which he reviewed the recent improvements in coal-mining practice, and indicated the directions in which further progress might be sought. Mr. H. R. de Salis discussed the improvements required in inland navigation, urging that the authorities controlling the canals should be re-organised. When the works of improvement have been carried out and efficient waterways provided, the problem of mechanical haulage will soon be solved. Mr. W. B. M. Jackson described the by-product coking plant at Clay Cross, a new plant of fifty Simplex ovens with all the mechanical appliances electrically driven. Mr. A. Victor Kochs also read a paper on by-product coking, in which he described the latest forms of the Koppers oven. Water supplies by means of artesian bored tube wells were dealt with at considerable length by Mr. H. F. Broadhurst; Mr. W. J. Kemp and Mr. G. A. Lewis described the occurrence and mining of gypsum in Sussex, in the beds discovered by the sub-Wealden exploration of 1872. The mine is undoubtedly a model of modern practice. The proceedings on Thursday concluded with a paper by the Rev. J. M. Capell, the inventor of the fan bearing his name, in which he urged

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that the application of duplicate fans on one upcast shaft would result in great economy.

On Friday Mr. Austin Hopkinson discussed the reform of British weights and measures. Mr. J. T. Brown described the methods of working the thick coal of Warwickshire, expressing, incidentally, the opinion that coal seams exist more or less continuously, but at great depth, under the large tract of country between the South Staffordshire and East Warwickshire collieries. Mr. D. M. Chambers gave an account of the mining of ozokerite at Boryslaw, in Galicia. Mr. C. Sandberg drew some general conclusions regarding the origin of the geological structure of South Africa. His conclusions are as follows:—The main directions of mountain-folding pressures have been north and south and east and west, the result of the former being predominantly evident in the central zone and that of the latter on the periphery of South Africa. These orogenic forces worked simultaneously, and together built up the tectonic structure of South Africa, which may thus no longer be regarded and studied as the outcome of many different and local, that is, comparatively insignificant, causes, that have worked independently of one another. These systems of forces acted on all the strata of the geological systems, from the Primary upwards, either at different periods, or possibly during one long period, when there was active deposition of the younger sediments in one place and denudation of the older in another. The origin of poorten (gaps in mountain ranges), river valleys, and pans is traceable to the same causes which produced anticlines and synclines, brachy-synclines, basins or domes, that is, to fold-producing pressures, the former set of phenomena being, in fact, only modifications or diminutives of the latter.

Another paper on South African geology was contributed by Mr. A. R. Sawyer, who gave some information regarding the general geological conditions obtaining in the New Rand goldfield in the Orange River Colony. The last paper was by Mr. H. W. G. Halbaum, who discussed the contradictory formulæ given by various authorities for the strength of cast-iron tubbing, and proposed a rational formula in which the action of corrosion as well as of the pressure to which the tubbing is subject is taken into account. In connection with the meeting, visits were arranged to the generating station of the Great Western Railway at Park Royal, and to the Portland cement works at Northfleet. The next meeting of the institution will be held at Sheffield on September 4, 5, and 6.

THE PLANET SATURN.

SATURN has now become well visible as a morning star. The rings being turned nearly edgeways to the earth, the belts in both hemispheres may be observed to advantage. The irregular markings can also be satisfactorily seen, as there will be practically no interference from the rings.

This planet is perhaps more utilised as a "show" object than as a subject for critical study by observers. There is no doubt, however, that it is well calculated to repay the most diligent attention. It is true that there is rarely an outbreak of such magnitude on the disc as that which affected the N. temperate region of Saturn in the summer of 1903. In fact, it would appear that really well-marked instances of irregular spots among the dark belts or bright zones are by no means frequent. Prof. Barnard said that the spots which he discovered in 1903 were the first he had ever distinguished upon the planet, and certainly these particular markings were the first that had been clearly and satisfactorily seen by the writer, though he had been observing Saturn for more than thirty-five years.

It is extremely probable that the real surface of Saturn, like that of Jupiter, is hidden from our view. We cannot therefore determine the rotation period of the planet's actual globe, but only of the dense vapours floating above it and forming its atmosphere. These vapours are obviously influenced by great differences in velocity, the period of the N. temperate latitude being twenty-three minutes longer in 1903 than the equatorial region in 1876–7. It is very desirable to ascertain the rates of velocity of the various latitudes, as has been done in the case of Jupiter. To this end the planet should be examined frequently at every opposition, so that, whenever any visible disturbances present themselves, a large number of their transits across the central meridian may be taken. In certain years, according to the best testimony, the belts are apparently smooth and even with no interruptions or irregularities due to dark and light spots. Visible atmospheric disturbances no doubt occur on Saturn more often than is supposed. Jupiter's envelope presents very frequent evidences of eruptions and irregularities capable of producing very conspicuous and in some cases long-enduring spots. To Saturn, therefore, the most beautiful planet of our system, we may naturally look to afford us fuller information as to his surface currents if observers will but keep a critical eye upon the physical aspect of the object as seen in good telescopes.

W. F. DENNING.

THE INTERNATIONAL COUNCIL FOR THE STUDY OF THE SEA.

THE sixth meeting of the International Council for the Study of the Sea was held at the Foreign Office in London on June 13 and 14, when delegates and experts representing Norway, Sweden, Finland, Russia, Germany, Denmark, Holland, Belgium, and Great Britain were present and took part in the discussions. The meeting was formally opened at noon on June 13 by Sir Edward Grey, Secretary of State for Foreign Affairs, who was accompanied by Lord Carrington, President of the Board of Agriculture and Fisheries. Prof. Otto Pettersson, of Stockholm, vice-president of the council, occupied the chair in the absence of the president, Dr. Herwig, of Hanover.

Sir Edward Grey said that from the necessities of our geographical situation and of our associations we have a natural interest in everything that concerns the sea. We have a great interest in the practical side of the labours of the Council, and are not deficient in interest in the scientific side as well. The British Government has shown the interest which it attaches to work of this kind by continuing for another year its subscription to the work of the Council. It must be a question of increasing interest as to whether the means of capture of fish in the sea, and the increase of the demand, are tending to overtake the natural supply. It is, of course, impossible to deal with this subject adequately simply by legislation within our own territorial waters, because the territorial limits of the sea have been arranged without any special regard to the habits of the fish, and the habits of the fish have been arranged by nature without any special regard to territorial limits. Therefore, whatever measures may be taken for ourselves, and whatever separate investigations other countries may make for themselves, if any question arises as to how the protection of fish in the North Sea can be controlled, encouraged, and preserved, it must form the subject of discussion between the different countries which are interested in the high seas.

Prof. Pettersson said that five years have passed since the commencement of the international investigation of the sea and eight years since the lines of the researches were laid down by the conference in Stockholm. The bounty of the Governments has supplied the means to carry on the work of investigation on a larger scale than has perhaps ever before been employed in scientific enterprise. The Council is convinced that the statesmen of Great Britain were well advised when they engaged their country to participate in this international work, of the ultimate success of which the Council feels assured. The British Government has taken the wise and just decision to devote a year to an inquiry in order to gain a sure ground for its future action. This work the Council leaves in the hands of the British Government with the utmost confidence.

Dr. Lewald (Germany) said that the German Government was of opinion that investigations must be continued, and that some form of international cooperation was required. M. Hamman (Belgium) and Commander Drechsel (Denmark) also spoke. The subsequent proceedings of the Council were conducted in private.

In connection with the meeting of the Council, Prof.

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